

Deviation Surveys

Date: 2008/07/01 Des: New well, planned vertical Definitive?:

Survey Data

MD (ftKB)	Incl (°)	Azm (°)
345		0.95
611		1.83
1,050.00		0.4
1,551.00		0.4
2,051.00		1
2,553.00		0.9
3,050.00		0.5
3,552.00		0.4
4,083.00		0.6
4,584.00		2.4
4,833.00		2.5
5,083.00		2.5
5,300.00		0.8
5,803.00		0.4
6,489.00		0.4
6,959.00		0.4
7,329.00		1.36

Date: 2012/02/16 Des: Cased Hole Gyro Definitive?:

Survey Data

MD (ftKB)	Incl (°)	Azm (°)
100		1.04 307.77
200		0.91 290.64
300		0.38 347.42
400		0.63 293.31
500		0.6 309.42
600		0.67 20.23
700		0.38 43.03
800		0.55 40.89
900		0.44 67.92
1,000.00		0.63 27.93
1,100.00		0.74 349.89
1,200.00		0.88 8.64
1,300.00		0.46 65.42
1,400.00		0.52 41.2
1,500.00		0.28 84.91
1,600.00		0.5 12.42
1,700.00		0.54 341.27
1,800.00		0.1 107.3
1,900.00		0.58 3.81
2,000.00		1.11 29.43
2,100.00		1.19 35.63
2,200.00		0.92 62.4

2,300.00	0.77	61.34
2,400.00	0.74	60.95
2,500.00	1.03	16.86
2,600.00	0.95	28.56
2,700.00	0.8	41.61
2,800.00	0.42	55.5
2,900.00	0.66	30.06
3,000.00	0.91	355.17
3,100.00	0.64	21.88
3,200.00	0.51	29.37
3,300.00	0.86	348.21
3,400.00	0.64	352.72
3,500.00	0.51	80.47
3,600.00	0.66	154.61
3,700.00	0.47	187.38
3,800.00	0.86	140.13
3,900.00	0.37	188.13
4,000.00	0.86	138.26
4,100.00	0.89	192.39
4,200.00	1.07	213.98
4,300.00	1.61	209.08
4,400.00	1.83	219.57
4,500.00	2.01	228.47
4,600.00	2.25	223.16
4,700.00	2.16	232.17
4,800.00	2.73	220.82
4,900.00	2.51	227.77
5,000.00	2.39	228.9
5,100.00	2.17	214.67
5,200.00	1.34	205.18
5,300.00	0.54	238.51
5,400.00	0.53	213.58
5,500.00	0.5	195.18
5,600.00	0.58	127.99
5,700.00	0.43	114.98
5,800.00	0.71	100.1
5,900.00	0.18	223.77
6,000.00	0.27	197.38
6,100.00	0.18	190.2
6,200.00	0.1	187.11
6,300.00	0.14	164.41
6,400.00	0.43	149.53
6,500.00	0.81	65.53
6,600.00	0.71	35.81
6,650.00	0.37	144.76

Job: Drilling - original, 7/1/2008 06:00 Prop?: Azm North Typ: Decl Corr (°): Convergence (°):

Method	Date	Survey Company	TVD (ftKB)	VS (ft)
	7/2/2008			
	7/2/2008			
	7/3/2008			
	7/3/2008			
	7/3/2008			
	7/3/2008			
	7/3/2008			
	7/3/2008			
	7/3/2008			
	7/4/2008			
	7/4/2008			
	7/4/2008			
	7/4/2008			
	7/4/2008			
	7/5/2008			
	7/5/2008			
	7/6/2008			

Job: Drilling - original, 7/1/2008 06:00 Prop?: Azm North Typ: Decl Corr (°): Convergence (°):

Method	Date	Survey Company	TVD (ftKB)	VS (ft)
			99.99	0.56
			199.98	1.39
			299.97	2
			399.97	2.54
			499.97	3.09
			599.96	3.97
			699.96	4.76
			799.95	5.36
			899.95	5.87
			999.95	6.5
			1,099.94	7.62
			1,199.93	9.02
			1,299.92	9.94
			1,399.92	10.45
			1,499.92	10.82
			1,599.91	11.26
			1,699.91	12.14
			1,799.91	12.56
			1,899.91	13.03
			1,999.90	14.38
			2,099.88	16.07
			2,199.86	17.29

2,299.85	17.98
2,399.84	18.62
2,499.83	19.79
2,599.81	21.38
2,699.80	22.63
2,799.80	23.36
2,899.79	24.06
2,999.78	25.35
3,099.78	26.66
3,199.77	27.57
3,299.76	28.69
3,399.75	29.98
3,499.75	30.61
3,599.75	30.16
3,699.74	29.24
3,799.74	28.25
3,899.73	27.36
3,999.73	26.48
4,099.72	25.16
4,199.70	23.63
4,299.67	21.62
4,399.63	19.17
4,499.57	16.77
4,599.50	14.18
4,699.43	11.59
4,799.34	8.63
4,899.23	5.36
4,999.14	2.52
5,099.06	-0.41
5,199.02	-3.03
5,299.00	-4.33
5,399.00	-4.96
5,499.00	-5.77
5,598.99	-6.5
5,698.99	-6.97
5,798.98	-7.24
5,898.98	-7.46
5,998.98	-7.8
6,098.98	-8.18
6,198.98	-8.42
6,298.98	-8.63
6,398.98	-9.07
6,498.97	-9.1
6,598.96	-8.3
6,648.96	-8.18

MD Tie In (ftKB): 10.00 Inclination Tie In (°): 0.00 Azimuth Tie In (°): 0.00 TVDTie In (ftKB): 10.00

NS (ft) EW (ft) DLS (°/100ft)

MD Tie In (ftKB): 0.00 Inclination Tie In (°): 0.00 Azimuth Tie In (°): 0.00 TVDTie In (ftKB): 0.00

NS (ft)	EW (ft)	DLS (°/100ft)
0.56	-0.72	1.04
1.39	-2.18	0.32
2	-2.99	0.77
2.54	-3.57	0.51
3.09	-4.48	0.17
3.97	-4.68	0.74
4.76	-4.25	0.35
5.36	-3.71	0.17
5.87	-3.04	0.25
6.5	-2.43	0.41
7.62	-2.29	0.46
9.02	-2.28	0.3
9.94	-1.8	0.74
10.45	-1.14	0.21
10.82	-0.6	0.37
11.26	-0.26	0.49
12.14	-0.32	0.28
12.56	-0.39	0.6
13.03	-0.27	0.61
14.38	0.24	0.64
16.07	1.32	0.15
17.29	2.64	0.55

17.98	3.94	0.15
18.62	5.09	0.03
19.79	5.92	0.72
21.38	6.58	0.22
22.63	7.44	0.25
23.36	8.2	0.41
24.06	8.79	0.33
25.35	9.01	0.53
26.66	9.15	0.44
27.57	9.58	0.15
28.69	9.65	0.58
29.98	9.42	0.23
30.61	9.79	0.8
30.16	10.48	0.72
29.24	10.67	0.37
28.25	11.1	0.64
27.36	11.53	0.67
26.48	11.99	0.68
25.16	12.32	0.8
23.63	11.63	0.41
21.62	10.43	0.55
19.17	8.73	0.38
16.77	6.4	0.35
14.18	3.74	0.31
11.59	0.91	0.36
8.63	-2.13	0.75
5.36	-5.31	0.39
2.52	-8.5	0.13
-0.41	-11.15	0.61
-3.03	-12.73	0.88
-4.33	-13.63	0.94
-4.96	-14.28	0.23
-5.77	-14.65	0.17
-6.5	-14.37	0.6
-6.97	-13.63	0.19
-7.24	-12.68	0.31
-7.46	-12.18	0.82
-7.8	-12.36	0.14
-8.18	-12.46	0.09
-8.42	-12.5	0.08
-8.63	-12.47	0.06
-9.07	-12.25	0.3
-9.1	-11.42	0.88
-8.3	-10.41	0.4
-8.18	-10.14	1.8

NSTie In (ft): 0.00 EWTie In (ft): 0.00

NSTie In (ft): 0.00 EWTie In (ft): 0.00